

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 27 JUN 2005



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| Applicant's or agent's file reference | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/KR2004/000086 | International filing date(day/month/year) 19 JANUARY 2004 (19.01.2004) | Priority date (day/month/year) 23 JANUARY 2003 (23.01.2003) | |
| International Patent Classification (IPC) or national classification and IPC IPC7 C07D 493/22 | | | |
| Applicant JUNG, Man-Kil | | | |

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 3 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

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| Date of submission of the demand 20 AUGUST 2004 (20.08.2004) | Date of completion of this report 20 MAY 2005 (20.05.2005) |
| Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer LEE, Jae Jeong  Telephone No. 82-42-481-5604 |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000086

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☒ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☐ the description:
 pages _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____

☒ the claims:
 pages _____ as originally filed/furnished
 pages* _____ as amended (together with any statement) under Article 19
 pages* 29 - 31 received by this Authority on 10/05/2005
 pages* _____ received by this Authority on _____

☐ the drawings:
 pages _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____

☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000086

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1 - 3, 5, 6

YES

Claims

NO

Inventive step (IS)

Claims 1 - 3, 5, 6

YES

Claims

NO

Industrial applicability (IA)

Claims 1 - 3, 5, 6

YES

Claims

NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: OGNYANOV et. al., "Synthesis and antimalarial activity of novel C12-ethers of 11-hydroxydihydroartemisinin". In: Dokladi na Bulgarskata Akademiya na Naukite (CODEN: DBANEH. ISSN: 0861-1459), 1993, 46(11), pp. 45-48.

The present invention relates to a new deoxoartemisinin dimer and a new deoxoartemisinin trimer which have excellent anticancer activity. D1 discloses novel C12-ethers of 11-hydroxydihydroartemisinin, which have good in-vitro antimalarial activity.

Although D1 teaches the C12-ethers of 11-hydroxydihydroartemisinin which have good in-vitro antimalarial activity, D1 does not disclose the features of the subject matter of claims 1 - 3, 5 and 6, which meet the criteria set forth in PCT Article 33(2), (3) and (4). The new deoxoartemisinin dimer and a new deoxoartemisinin trimer which have excellent anticancer activity are not anticipated by any of the references on record.

Thus, the invention described in the present application is considered to be novel, inventive and industrially applicable.